ICR News 2018

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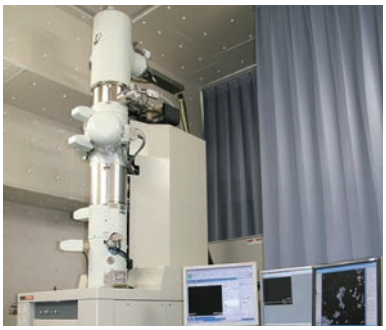
International Joint Usage/Research Center: Global Frontier/Interdisciplinary Research Core for Deepening Investigation and Promoting Collaboration in Chemistry-oriented Fields

■ Prof TERANISHI, Toshiharu (Head of International Joint Research Station)

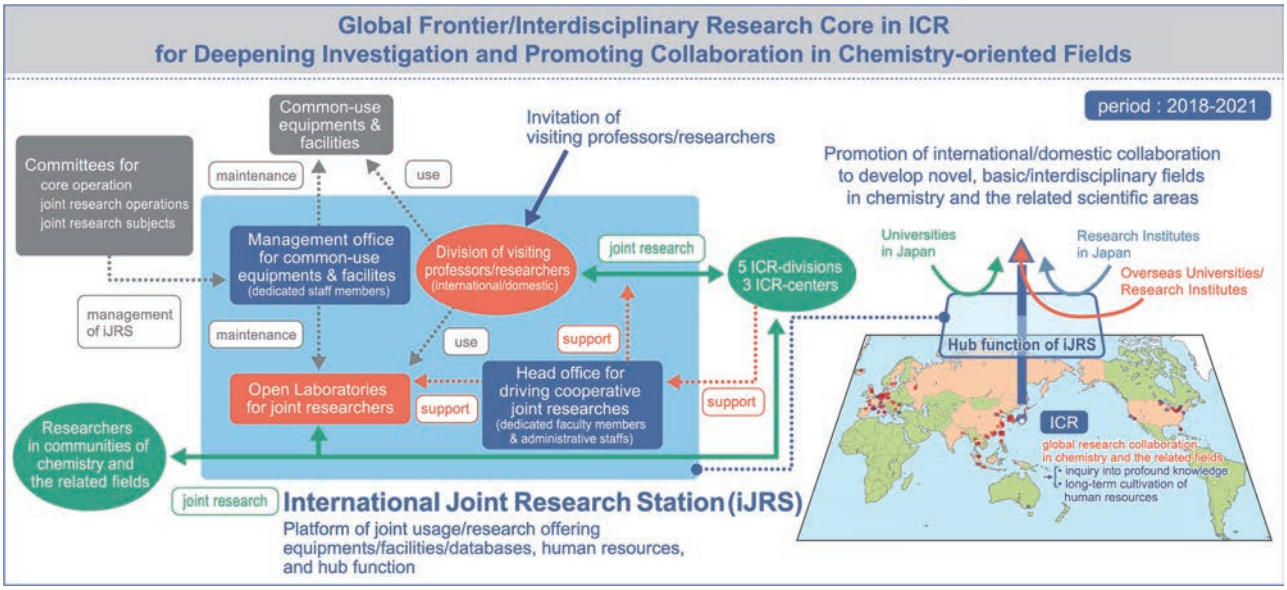
Since the fiscal year 2010, the Institute for Chemical Research (ICR) has been proactively collaborating with domestic/overseas universities and research institutes as a Joint Usage/Research Center (JURC) approved by the Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan. In 2018, MEXT favorably evaluated the international activities of ICR-JURC to approve ICR as the international JURC (iJURC), proclaiming "the Global Frontier and Interdisciplinary Research Core in ICR for Deepening Investigation and Promoting Collaboration in Chemistry-oriented Fields". Around 100 joint research subjects including around 50 international subjects will be adopted next year (Research Project Categories: Field-specific (pre-planned) Research, Proposal-based Research, Promotion of Collaborative and Multidisciplinary Research, and Facilities and Equipment Use). Several frontier instruments, including Dynamic Nuclear Polarization Nuclear Magnetic Resonance Spectrometer, have been newly equipped and utilized in the joint research, and a management office for those common-use instruments has been also organized. ICR-iJURC will conduct advanced joint research in chemistry-related fields, with the emphasis being placed on promoting international joint usage/research, enhancing international academic network, and training young researchers with an international perspective.

Dynamic Nuclear Polarization-enhanced NMR (DNP-NMR) Systems



High Functionality Electron Microscopes

Supercomputer System



Specially Appointed Prof KANEHISA, Minoru Received the 2018 Clarivate Citation Laureates

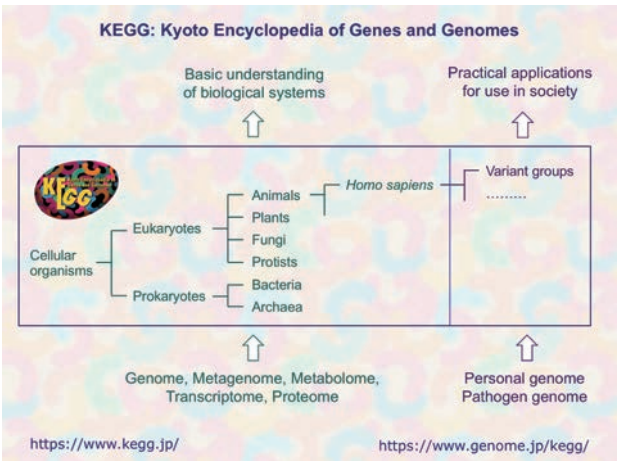
Specially Appointed Professor Minoru Kanehisa was listed on a list of Clarivate Citation Laureates 2018 for his contributions to bioinformatics, specifically for his development of the Kyoto Encyclopedia of Genes and Genomes (KEGG). This year, Clarivate Analytics named 17 world-class researchers as Citation Laureates. This designation celebrates researchers whose work is deemed to be, 'of Novel stature', as attested by exceptionally high citation records within the Web of Science.

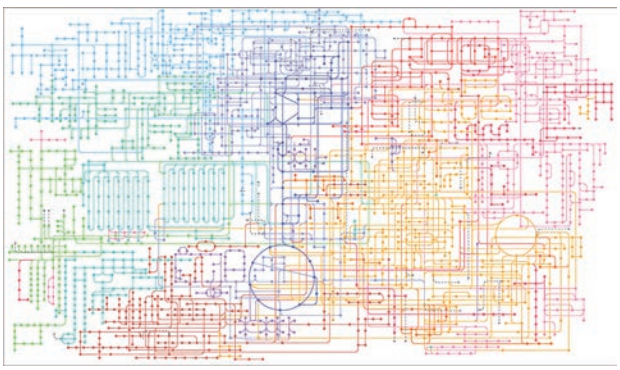
Photo Courtesy of KURIYAMA, Jin, PRAP Japan, Inc.

■ Specially Appointed Prof KANEHISA, Minoru

KEGG

KEGG (https://www.kegg.jp/ or https://www.genome.jp/kegg/) is a database resource for biological interpretation of genome sequences and other molecular datasets in life sciences. I started KEGG in 1995 under the Human Genome Project in Japan, foreseeing the need for a reference resource that would enable computational reconstruction of the biological systems, including the cell, the organism and the ecosystem, from the genome information. In the traditional view, the genome is a blueprint of life containing all necessary information that would make up a biological system. In my view, however, the genome specifies only the molecular building blocks, while the cell, the basic unit of life, contains information about how they interact and react to form a system. It must be emphasized that what we inherit is not just the genome, but the entire cell, and there is a cellular continuity of the germ line leading to the origin of life. From this perspective, cellular functions and other high-level biological features are accumulated from experimental observations reported in published literature and represented in KEGG in terms of molecular interaction/reaction networks. By integrating the molecular networks (wiring diagrams) and the genes in the genomes (building blocks) for all available cellular organisms, KEGG has become a reference resource for deciphering the genome. Currently, my main interest is to make KEGG more useful in practical applications by integrating knowledge of diseases, drugs and related human gene variants in terms of perturbed molecular networks.





The 15th International Symposium on Inorganic Ring Systems (IRIS-15)

■ Prof TOKITOH, Norihiro

The 15th International Symposium on Inorganic Ring Systems (IRIS 15, 24–29 June 2018) was held at Uji Obaku Plaza, Institute for Chemical Research (ICR), Kyoto University in conjunction with the Institute for Chemical Research International Symposium 2018 (ICRIS-2018). The conference was held under the auspices of ICR, and co-hosted by ICR Joint Usage/Research Center, the Chemical Society of Japan, Society of Synthetic Organic Chemistry Japan, Kinka Chemical Society Japan and the Society of Silicon Chemistry Japan, under the support of Kyoto University Foundation, Tokuyama Science Foundation and Kyoto Convention & Visitors Bureau.

This conference occurs every three years and is the premier international showcase for Main Group Chemistry, including Organometallic Chemistry and Inorganic Materials Chemistry. This was the first IRIS meeting to be hosted in Japan. Fortunately, 205 scientists including world-leading professors, postdoctoral fellows, and research students from around the world participated. The conference program contained 5 plenary and 15 invited lectures by internationally renowned scientists, as well as 52 short communications and 82 poster presentations. The plenary lectures were presented by Prof. Manfred Scheer (Universität Regensburg, Germany), Prof. Cameron Jones (Monash University, Australia), Prof. David Scheschkewitz (Universität des Saarlandes, Germany), Prof. Axel Schulz (Universität Rostock, Germany) and Prof. Soichiro Kyushin (Gunma University, Japan) at the KIHADA hall. For selected outstanding oral communications and posters presented by students, excellent prizes were awarded. The prizes were kindly sponsored by the Chemical Society of Japan and the Royal Society of Chemistry. In addition, it was our great pleasure and honor to celebrate the 90th birthday of Prof. Robert West, the giant legend in silicon chemistry, and we have enjoyed his chemistry as the Special Keynote Lecture. Various issues related to the synthesis, structure, theoretical chemistry and reaction mechanism of novel inorganic ring systems were actively discussed during the conference.

Symposium Photo taken on June 28.

Celebration of the 90th birthday of Prof West (left).

Lectures and Oral Presentations

Poster Session

Kyoto University Chemistry Talent-Spot Event 2018 Manila

■ Prof UESUGI, Motonari

ICR hosted a student recruitment event named "Kyoto University Chemistry Talent-Spot Event 2018 Manila" on January 21, 2018 at Manila Hotel in Manila, Philippines. The goal of this event is to recruit outstanding students to ICR as Japanese government-sponsored foreign students.

Eleven principal investigators from ICR visited Manila to interview thirty shortlisted candidates having potential for a MEXT scholarship. The actual event included eleven short tutorial lectures on a wide range of topics in chemistry and face-to-face interviews with the candidates. During our visit to Manila, we were invited to University of Santo Tomas (UST) to attend the MOU signing ceremony between ICR and UST. We also had a chance to visit the University of the Philippines Diliman to deliver tutorial lectures to its chemistry students.

In March 2018, top six students from the interview were invited to ICR for a one-week research experience program. On their last day at ICR, each gave a presentation on their research work they had been engaged in during the stay. Three out of the six applied for a MEXT scholarship, and two of them has successfully acquired the scholarship.

Tutorial Session

Student Interview Session

MOU Signing Ceremony at UST

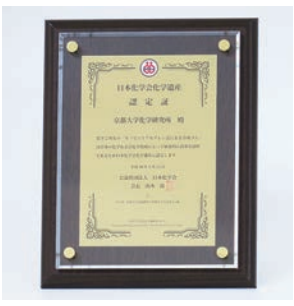
A Sample of Acrylonitrile Butadiene Rubber (NBR), Synthesized with the Aid of the "Monovinylacetylene Method" and Conserved at ICR, Was Certified as the Chemical Heritage by the Chemical Society of Japan

■ Prof WATANABE, Hiroshi

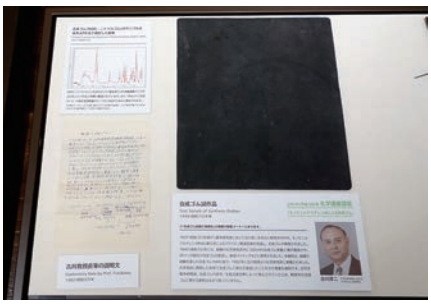
At the Institute for Chemical Research (ICR) in 1942, Professor Junji Furukawa of Kyoto University synthesized acrylonitrile butadiene rubber (NBR) in the pilot plant scale (200 kg/day) for the first time in Japan. One of the starting materials, butadiene, was synthesized with the epoch-making "monovinylacetylene method" developed by Professor Furukawa before the second world war, and the pilot plant at ICR was later relocated to the Niihama factory of Sumitomo Chemical Co., Ltd. thereby serving as the firm basis for industrial production of NBR in Japan.

A NBR sample from the above pilot plant was donated by Professor Furukawa to ICR in 1982, and has been carefully conserved at ICR since then. The Chemical Society of Japan appreciated the historical importance of this NBR sample to have certified it as the Chemical Heritage as of March 21, 2018.

The certificate presentation ceremony on 21 March 2018; (left to right) Yasuhiro Takaki (Director of Nature and Science Museum, Tokyo University of Agriculture and Technology), Hisashi Yamamoto (President of the Chemical Society of Japan), Norihiro Tokitoh (Director of ICR) at the ceremony.



Certificate of Chemical Heritage



NBR sample certified as Chemical Heritage (black sheet) and documents of explanation